

RESEARCH HIGHLIGHTS

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ECONOMIC IMPACTS OF RESIDENTIAL CONSTRUCTION

Introduction

From published statistics, it is clear that residential construction is an important economic activity that impacts significantly on the overall economy. New home building, renovations and other residential spending totalled \$49 billion in 1999, accounting for over 5% of Canadian Gross Domestic Product ("GDP"). New home construction, which represents close to half of total residential construction spending, is highly sensitive to economic conditions and its growth during cyclical upturns is important in helping the economy regain momentum. Over the latter half of the 1990s, when considerable progress was made in increasing employment and reducing the overall degree of slack in the Canadian economy, housing starts increased by 35%, from 110,933 in 1995 to 149,968 in 1999.

Published data do not detail the contribution of housing construction, renovation and ancillary expenditures to output and employment growth in the Canadian economy. Residential housing expenditures generate activity in construction, in industries that supply goods and services to the construction industry, and in a broad range of other related and unrelated industries that benefit from the resulting increase in income flows within the economy. To estimate these impacts, it is necessary to draw on economic models that specify the nature of the links between housing and other sectors of the Canadian economy.

Research Program

To shed light on the importance and contribution of residential construction, Canada Mortgage and Housing Corporation has published four studies:

- *Macroeconomic Impacts of the Housing Sector* (Oct. 1997)
- *The Macroeconomic Impacts of Housing Construction Activity: Simulations with the FOCUS Model* (March 1998)
- *The Economic Impacts of Ancillary Housing Expenditures* (forthcoming)
- *The Macroeconomic Impact of the Building Materials Industry in Canada* (1999)

All four studies use economic models to develop comprehensive estimates of the impact of housing or housing-related expenditures on output, employment and various other macroeconomic variables. The studies thus investigate each of the three major channels through which housing expenditures may impact on the economy:

- through the *direct impacts* of expenditures on producers - for example, the contribution of new housing expenditures to increasing activity in the construction industry;



- through the ***indirect impacts*** of the increased demand for materials and services from industries that supply the construction industry - and, subsequently, from their suppliers, as the increase in demand travels back along the production chain;
- through the ***induced impacts*** of the increased income flows and expenditures that result as the direct and indirect impacts proceed through the economy.

To estimate the indirect impacts of housing expenditures, detailed information is needed on inter-industry transactions. Researchers must understand the links by which an increase in residential construction results in increased sales of building materials, such as flooring and concrete products, and by which the increased activity in building materials industries percolates down to impact on raw material producers, transportation service providers and other industries. For this purpose, all four studies rely on Statistics Canada's Input-Output database. The latest Input-Output database (which is used in the study of ancillary expenditures) provides a snapshot, based on 1995, of industry sales to and from each other for over 160 Canadian industries.

To estimate the induced impacts of housing expenditures, it is necessary to utilize a broad model that is capable of tracing the effects of increased spending, and the associated changes in employment and income from increased housing activity, throughout the economy. Two macro-economic models of the Canadian economy have been utilized in the research program:

- The Informetrica Model ("TIM"), a large, annual model, which uses equations based on economic theory and historical data to specify behaviour for approximately 700 categories of final demand and 120 producing industries; and

- FOCUS, a medium-scale quarterly model with over 300 behavioural equations and identities and over 600 variables in total, which is maintained at the University of Toronto's Institute for Policy Analysis.

The research program examines different aspects of housing's impact on the broader economy. Two of the studies, *Macroeconomic Impacts of the Housing Sector* and *The Macroeconomic Impacts of Housing Construction Activity*, investigate the impact of a temporary (2 year) increase in housing activity, resulting from either investment in new housing or increased spending on the renovation of the existing housing stock.

The Economic Impacts of Ancillary Housing Expenditures is a complementary study that takes account of the fact that housing expenditures give rise to ancillary spending in such areas as land development (e.g. surveying, site preparation, consultants services), infrastructure development (e.g. roads, sidewalks, sewers), real estate services, legal services and financing services.

Ancillary expenditures accompany the construction of new housing units, but some ancillary spending also occurs with the sale of newly constructed dwellings and the sale of existing dwellings. By taking account of ancillary expenditures, the research program is able to provide a more complete assessment of the economic impact of housing activity.

The fourth study, *The Macroeconomic Impact of the Building Materials Industry in Canada*, examines the direct, indirect and induced impacts of activity within the various sub-industries that comprise Canada's building materials sector. The study estimates the GDP and employment impacts in 1995 of expenditures on building materials associated with new construction, repairs, renovation and exports. In terms of residential housing, this study is of interest because of the additional insights it provides into those industries, outside of the construction sector itself, that are most significantly affected by changes in housing activity.

Key Assumptions

A major part of the research exercise consists of running simulations to investigate how the direct and indirect impacts of housing activity will impact on the overall economy. Simulations using econometric models, however, are highly sensitive to underlying assumptions about key economic factors. In simulating the impact of housing expenditures, results will depend particularly on what is assumed about:

- the economic performance of the economy over coming years;
- the economic policies pursued by the government and the Bank of Canada; and
- the extent to which housing investment needs are met by imports rather than domestic production.

The economic performance of the economy is important because an increase in housing expenditure will have different results in a slowly growing economy with a significant degree of slack than in a quickly growing economy that is operating close to capacity. Economic conditions influence important economic variables, such as business investment and labour productivity. An increase in housing expenditures will have a greater impact on wages and prices in a quickly growing than in a slowly growing economy.

Of special interest in terms of economic policies, is whether the economy is following a fixed or flexible exchange rate regime. With flexible exchange rates (where the value of the Canadian dollar is allowed to change in response to market forces), an increase in housing expenditures will lead to downward pressure on the Canadian dollar (a consequence of the increase in income from additional housing expenditures and the associated rise in imports), which will, in turn, generally stimulate increased Canadian exports. Economic activity thus receives an additional boost under a flexible exchange rate

policy. The impact of housing expenditures will tend to be more modest when the government instead uses higher interest rates to hold the value of the Canadian dollar constant.

The third factor, the behaviour of imports, will determine to what extent Canadian firms, rather than foreign producers, benefit from the increased material and service needs of the residential construction industry. For example, if the import content of housing were to increase in coming years, this would reduce the macroeconomic impacts of increased housing activity. To test the impact of higher import content, simulations were run using both "normal" imports and imports that were double the proportions in 1992.

Applying various combinations of these three major factors - i.e. high-growth vs. low-growth; flexible exchange rates vs. fixed exchange rates; and "normal" vs. "double" imports - leads to eight different sets of results. In the research program, these eight simulations were run to assess the overall impact of two different types of housing expenditures:

- (i) a \$1 billion in dollars of the year 1986 ("\$1986") investment in new housing in each of 1999 and 2000; and
- (ii) a \$1 billion (also in \$1986) investment in renovation of existing housing in each of 1999 and 2000.

In current (i.e. 1999) dollars, the \$1 billion translates into around \$1.4 billion in spending in the case of both new construction and alterations. This amount represents almost a 6% increase in investment in new housing and about an 8% increase in renovation spending¹ - increases that are large, but not unreasonable in terms of historical experience.

A related set of simulations, using similar assumptions, were then run to examine the impact of the ancillary housing expenditures associated with a \$1 billion (in \$1986) increase in housing activity in 1999, as these ancillary expenditures were not encompassed in the previous studies.

The Macroeconomic Impacts of Housing Activity: One Scenario Explained

Table I reproduces the results of one of the middle-case scenarios examined in the research program—a scenario involving a combination of high growth, fixed exchange rates, and normal imports.

Estimates of the impact of residential construction spending depend not only on the economic assumptions being made, but also on the features of the model used to carry out the simulations. TIM and FOCUS,

the models used in this research program, have different structures and incorporate different representations of the way in which major economic developments affect spending and investment and influence activities in different industry sectors. In Table I, the GDP and employment impacts produced by TIM are given in brackets to allow comparison with the results obtained using FOCUS. The impacts on the consumer price index ("CPI") and on federal and provincial revenues are also shown.

Table I: The Macroeconomic Impact of Housing Activity

Scenario: - high economic growth - fixed exchange rate - normal imports	Focus Model Estimates (TIM Model Estimates)				
	1999	2000	2001	2002	2003
New Construction (\$1 billion in \$1986 in 1999 & 2000)					
GDP Impact - % change	.18 (.17)	.23 (.16)	.03 (.00)	-.11 (-.02)	-.21 (-.03)
Employment Impact - '000s	21.4 (15.2)	30.4 (16.5)	12.7 (3.4)	-1.8 (1.0)	-18.1 (-0.6)
CPI Impact -% change	0.02	0.06	0.1	0.13	0.15
Fed. Revenue Impact - \$ millions (in \$ current)	397	660	415	159	-84
Prov. Revenue Impact - \$ millions (in \$ current).	308	546	356	131	-44
Alterations (\$1 billion in \$1986 in 1999 & 2000)					
GDP Impact - % change	.17 (.16)	.22 (.16)	.03 (.01)	-.10 (.00)	-.19 (.00)
Employment Impact - '000s	19.3 (13.8)	28.2 (14.8)	12.5 (3.0)	-1.1 (0.7)	-16.5 (-0.7)
CPI Impact -% change	0.02	0.05	0.09	0.12	0.15
Fed. Revenue Impact - \$ millions (in \$ current)	377	626	397	156	-67
Prov. Revenue Impact - \$ millions (in \$ current)	289	514	336	123	-32

The reported results confirm that the econometric model employed does make a difference. The economic impact of housing activity was found to be significantly larger using the FOCUS model than the TIM model (the bracketed numbers). Beyond this, Table 1 highlights a number of significant findings of the research program.

First, it can be seen that a temporary increase in housing expenditures creates its own cyclical pattern of activity. Initially, as the housing expenditures raise income and consumption and the effects spread and multiply through the economy, output and employment increase. Because time is required for the additional hiring and spending, the expenditure stimulus takes a year or more to exert its main impact on the economy, and its effects persist about a year after the stimulus is removed. Subsequently, however, in the final years of the simulations, the earlier additional housing expenditures exert a negative impact on output and employment (often called a "contractionary aftershock"). In all models, the effects of a temporary economic stimulus eventually disappear and the economy returns to its long term growth path. In FOCUS, the negative output and employment effects in years 4 and 5 are especially marked because by this point the stimulus has expired and the overall economy is now under pressure to reduce wage demands created by the housing investment. As compared to TIM, the equations in FOCUS result in a more significant reduction in output and employment as the economy comes under pressure to return to the equilibrium dictated by the major growth determinants in the model.²

These results suggest the possibility of using housing expenditures as a tool of countercyclical fiscal policy. Effectively using housing expenditures to soften an economic downturn, however, is a formidable challenge. Given the lags that exist, policy makers face the difficult task of ensuring that the stimulus is introduced ahead of an economic downturn. If introduced at the wrong time, the stimulus, and later its aftershock, could worsen, rather than smooth, the economic cycle.

Secondly, Table 1 shows that the macroeconomic impacts depend, in part, on the type of housing stimulus. Expenditures on new construction have a slightly greater impact on output and employment than expenditures on alterations. This is mainly because new construction has less import content than alterations and, hence, a greater proportion of the spending benefits domestic producers.

With new construction, the economy also experiences the impact of ancillary expenditures on land development, infrastructure investment and various professional services. The impact of these ancillary expenditures, which are not incorporated in the results reported in Table 1, are examined in Table 2. The research indicates that:

- \$1 billion in new residential construction would have given rise in 1999 to \$181 million in ancillary investment (net of indirect taxes);
- \$1 billion in sales of newly constructed dwellings would have give rise in 1999 to \$15 million in ancillary expenditures (net of indirect taxes) related to purchase, sale and financing; and
- \$1 billion in sales of existing dwellings would have given rise in 1999 to \$46 million in ancillary expenditures (net of indirect taxes) related again to purchase, sale and financing; where all numbers above are in \$1986.

Table 2 reports the results of simulations, using assumptions similar to those in Table 1, to assess the macroeconomic impact of these ancillary expenditures.³ The ancillary expenditures associated with construction and with sale of new homes will have a significant additional impact on employment and output for some years. For example, the ancillary expenditures associated with new construction are estimated to have a first year employment impact of about 4,500 jobs, and the analogous impact for new home sales is estimated to be around 400 jobs.

Table 2: The Macroeconomic Impact of Ancillary Expenditures

Scenario: - high economic growth - fixed exchange rate - normal imports	1999	2000	2001	2002	2003
Ancillary expenditures from \$1 billion (\$1986) in residential construction: \$181 million (\$1986) in residential investment					
GDP Impact - % change	0.04	0.01	0	-0.02	-0.03
Employment Impact - '000s	4.5	2	0.9	-1.1	-2.7
Ancillary expenditures from \$1 billion (\$1986) in new dwelling sales: \$15 million (\$1986) in residential investment					
GDP Impact - % change	0	0	0	0	0
Employment Impact - '000s	0.4	0.2	0.1	-0.1	-0.3
Ancillary expenditures from \$1 billion (\$1986) in sales of existing dwellings: \$46 million (\$1986) in residential investment					
GDP Impact - % change	0.01	0	0	0	0
Employment Impact - '000s	1	0.5	0.2	-0.2	-0.6

Thirdly, the simulations suggest that, although a housing stimulus will impact on a broad range of macroeconomic variables (and not simply output and employment), these adjustments in the performance of the economy are unlikely to be a source of concern. The impact of a two-year increase in residential construction on the CPI, for example, is quite modest. In the high-growth scenario reported in Table 1, the impact on the CPI by the fifth year is only 0.15%. Inflationary effects are greater under a flexible exchange rate policy regime in which the value of the Canadian dollar is allowed to depreciate, but the research suggests that, even in this case, price increases are unlikely to attract the attention of the Bank of Canada.

The government's fiscal balance, another closely watched economic measure, is likely to be positively impacted by increased housing activity. Stronger economic activity will generate higher federal revenues, and this is expected to more than offset any increases in federal spending resulting from higher prices

and/or interest rates. Provincial budget balances are also estimated to improve - to a slightly lesser extent than the federal government's budgetary balance - as a result of the increase in economic activity.

The Significance of the Macroeconomic Impacts

Table 1 reports the simulation results from one seemingly reasonable set of assumptions. Other scenarios, incorporating alternate sets of assumptions, lead to somewhat different conclusions about the extent to which housing activity can boost output and employment. For purposes of comparison, it is useful to look at:

- "output multipliers", which indicate the increase in constant dollar GDP⁴ for each additional dollar of real spending;⁵ and
- "employment multipliers", which show the increase in employment per million dollars of spending.

Multipliers in the first year and cumulatively over a five year period are examined. TIM and FOCUS yield different multipliers (with differences in the 5 year multipliers being especially marked). The potential effects of employing alternative sets of assumptions, however, are most clearly illustrated by the FOCUS simulations.

For the simulations reported in Table 1 pertaining to new construction, the one year output multiplier is 1.2 (see Scenario 1 in Table 3). The five year output multiplier, which incorporates the combined impact of GDP gains in the first three years and GDP losses in the final two years, is 0.4. The estimated impacts of new housing construction under FOCUS are much greater if the assumption of an economy experiencing high economic growth in Table 1 is replaced by an assumption of low-growth, and the assumption of a fixed exchange rate policy is replaced by the assumption of a flexible exchange rate policy. Under this second scenario (Scenario 2 in Table 3)—one characterized by normal imports, low-growth and a flexible exchange rate policy—the one year output multiplier rises to 1.5 and the five year multiplier jumps to 2.3. In Scenario 2, the housing stimulus translates more into output and

employment increases and less into price increases because the economy is assumed to be operating well below capacity. In addition, the economy grows more rapidly than in Scenario 1 because government policy leads to relatively lower interest rates, which promote spending, and a depreciating currency, which encourages exports and discourages imports.

The impacts of new construction are much smaller under an alternative third scenario that takes account of the possibility that much greater reliance will be placed on imports over the simulation period. In this third scenario, the assumptions of high growth and a fixed exchange rate policy are combined with the assumption of a doubling in import content. In Scenario 3, as in Scenario 1, the assumption of an economic environment featuring high growth and a fixed exchange rate regime tend to limit the ability of new construction to generate higher output. The stimulative capacity of new residential construction is further reduced in Scenario 3, however, because, now, an increased proportion of spending needs are satisfied by foreign, rather than domestic producers. The one year output multiplier for Scenario 3 is 1.1, and the five year output multiplier is only 0.2.

Table 3: GDP and Employment Multipliers Associated with New Housing Investment

	Assumed underlying economic environment	GDP Multipliers (increase in constant dollar GDP for each additional dollar of real spending)		Employment Multipliers (Increase in employment per million dollars of spending)	
		1 Year	5 Year	1 Year	5 Year
Scenario 1	high growth, fixed exchange rate normal imports	1.2	0.4	21	22
Scenario 2	low growth flexible exchange rate normal imports	1.5	2.3	23	47
Scenario 3	high growth fixed exchange rate double imports	1.1	0.2	20	21

Note: Reported results are based on simulations using FOCUS model.

The three scenarios, which incorporate the highest and lowest output multipliers resulting from the FOCUS simulations, are described in Table 3. The employment multipliers, which are included in the Table along with the output multipliers, show the one-year and five-year employment gains per million (1986) dollars of new construction spending.

As in the case of the output multipliers, the employment multipliers are highest under Scenario 2 and lowest under Scenario 3. The most marked differences again apply to the five-year multipliers. Based on a rough translation of investment dollars into residential units, the employment multipliers suggest that each newly constructed housing unit creates in the range of about 2.5 (from Scenario 3) to 5.5 (from Scenario 2) person-years of employment spread over a five year period.⁶

So the lowest impact on employment is expected to occur in an economic environment characterized by a high level of economic activity, a fixed exchange rate policy regime and a relatively heavy reliance on imports to fill the demand created by housing expenditures. Conversely, the highest employment impact occurs in an economic environment in which economic activity is growing slowly, the value of the Canadian dollar is allowed to depreciate, and in which relatively less of the additional demand is being filled by imports. In the latter environment, there is more room for additional housing expenditure to add to employment.

GDP and employment multipliers can also be calculated for housing alterations and for ancillary housing expenditures. The multipliers for alterations are not very different from those for new construction. Since alterations generate slightly less domestic activity than new construction, however, output and employment multipliers are somewhat less than those in Table 3.

For ancillary expenditures, simulation results are available only for Scenarios 1 and 2. When the employment from ancillary expenditures is added to the employment gains from construction expenditures, the estimated employment resulting from each newly constructed housing unit increases by about one-half person-year.

Impacts on Canadian Industries

While a wide range of Canadian producers will feel the effects of increased housing activity, the main beneficiaries will be construction firms and their suppliers, most of whom are in the building materials industry. The direct impact of new residential spending on construction activity represents between 20% and 30% (depending on the scenario examined) of the total first year output growth from new residential construction investment and from additional spending on housing alterations. The indirect impact on supplier industries accounts for another 20% to 30% of first-year GDP growth. Therefore, construction firms and suppliers to the construction industry experience about half of the short-term growth generated by new housing investment.

The direct and indirect impacts of new residential construction and housing alterations for selected industries are given in Table 4. The data indicate:

- while direct impacts are relatively more important with new construction, indirect impacts are more important in the case of alterations;
- a doubling of the import content of construction activity would substantially reduce the indirect impacts from spending on both new construction and alterations;
- increased housing activity has an important indirect impact on firms in the service sector - including wholesalers, professional service firms, financial institutions, and for-hire trucking companies;
- the indirect impacts of housing activity are widely dispersed among producers of building materials, but the manufacturing firms experiencing the largest indirect impacts are wood producers, metal fabricating firms, and cement and clay products manufacturers.

Table 4: Distribution of Direct and Indirect GDP Impacts from Spending on Residential Construction and Housing Alterations

	New Construction		Alterations	
	Normal Imports	Double Imports	Normal Imports	Double Imports
	(Percentage Shares)			
Direct Impact -residential construction	50.1	56.8	41.7	49
Indirect Impacts				
Wholesale trade margins	8.3	8.8	10.4	11.4
Wood	7.1	6.4	9.2	8.6
Professional services	5.7	6.3	4.7	5.4
Finance & business	3	2.9	3	3
Metal fabricating	2.6	0.5	3.5	0.7
Cement & clay products	2.4	1.8	2.5	2
Forestry	1.7	1.6	2	1.9
Truck transport	1.6	1.6	1.9	1.9
Other Industries	17.5	13.3	21.1	15.8
Total Indirect	49.9	43.2	58.3	50.7
Direct and Indirect Impact	100	100	100	100

Other industries benefit from the ancillary expenditures associated with new housing construction. As a result of the need to develop new land sites, to establish on-site and off-site infrastructure and to carry out land transactions, there will be an increased demand for the services of construction firms, engineering firms, real estate agents, lawyers, appraisers, surveyors, and various municipal government departments (e.g. water, sewage, local and regional roads, parks).

The indirect or “upstream” impacts from ancillary housing expenditures will benefit a wide variety of additional firms, including various building materials’ suppliers, equipment and software providers, accountants and other professionals. While ancillary expenditures represent a small proportion of the total investment associated with the development of new housing units, the direct and indirect impacts of these expenditures are important for firms that specialize in land and municipal infrastructure development, and in supplying materials and services to these specialized construction, engineering and legal firms.

Residential Construction and the Building Materials Sector

A significant share of the increased activity generated by new residential construction occurs in the building materials sector. But how important is residential construction to Canadian producers of building materials? One way to answer this question is to estimate the contribution of various sources of demand to the output of firms involved in the production of commodities such as wallboard, plumbing fixtures, windows and doors, flooring, roofing, concrete products and kitchen cabinets.

In 1995, demand from various sources resulted in the production of \$10.7 billion (\$1995) in building materials. Activity in the building materials sector represented about 8.5% of total manufacturing sector GDP in 1995. As can be seen in the top half of Table 5, exports were the primary source of direct demand for producers of building materials, accounting for 42% of total output. Demands from various components of residential construction (including new construction, residential engineering and repair & renovation) contributed to just over 30% of building material GDP, with repair and renovation accounting for over half of residential construction's contribution.

Table 5: Building Materials Sector: GDP & Employment Impacts by Source of Demand, 1995

	Residential Construction			Non-residential Construct. & Repair	Exports	Total
	New Const.	Resident. Engineer.	Repair & Renovation			
Direct Impact						
i) GDP Impact -millions of \$1995 (% share of total)	1321 (12.4)	109 (1)	1827 (17.1)	2943 (27.6)	4461 (41.8)	10,662 (100)
ii) Employment Impact -'000s (% share of total)	23.0 (12.7)	1.5 (0.8)	29.9 (16.5)	44.2 (24.3)	83.1 (45.7)	181.7 (100)
Total (direct, indirect & induced) Impact						
i) GDP Impact -millions of \$1995 (% share of total)	2,825 (12)	217 (0.9)	3855 (16.3)	6079 (25.8)	10,622 (45)	23,598 (100)
ii) Employment Impact -'000s (% share of total)	51.5 (12.1)	3.5 (0.8)	68.2 (16)	102.5 (24)	201.4 (47.2)	427.0 (100)
<i>Note: Data along rows may not add to 100% due to rounding.</i>						

Similarly, a high proportion of building-material jobs were attributable to residential construction, but the residential sector was not the most important source of employment demand. Residential demand is estimated to have accounted for 30% of the 181,711 jobs in the sub-industries involved in manufacturing building materials in 1995. It was more important than non-residential construction demand (at 24%), but less important than export demand (at 46%).

The bottom half of Table 5 provides a broader perspective on the importance of residential construction to the building materials sector. Here the focus is not just on activity within the building materials sector, but also on all related activity in industries that supply producers of building materials (the indirect impact) and in industries that benefit from the associated increase in spending flows in the economy (the induced impact). Taking account of direct, indirect and induced impacts, \$23.6 billion (\$1995), or 3.5% of Canada's total GDP in 1995, was attributable to the building material sector. The research finds that, in terms of this broad measure of sector impact, exports are still the primary demand source. Residential construction demand is still more important than non-residential demand, and the repair and renovation category continues to be the most important component of residential construction demand. Most building materials sector activity takes place in Ontario and Quebec. Of the sector's total impact on GDP in 1995, 34% was attributable to activity in Ontario and 25% to activity in Quebec. British Columbia, a major producer of lumber and wood products, accounted for a significant 21% of the sector's total GDP impact in 1995.

In addition to assessing the general contribution of residential construction to building material activity, the research investigated the importance of residential demand for the different sub-industries that constitute the building materials sector. For this latter purpose, it is interesting to look at direct impacts—to examine the relative importance of residential construction and other sources of demand to activity occurring within various building commodity categories. The results of this detailed investigation of direct GDP impact by source of demand are provided in Table 6.

It can be seen that residential construction is a particularly important source of demand for producers of windows and doors (accounting for 65% of direct GDP impact), kitchen cabinets (64%), textile floor coverings (53%), gypsum & wallboard (47%), and heating and air conditioning (46%). In the case of windows and doors and kitchen cabinets, two commodity categories characterized by the specialized and high-value nature of their production, almost two-thirds of total output is attributable to demands from the residential construction sector. By contrast, relatively low value-added products, such as lumber and flooring, are highly dependent on the demand originating in export markets. Some less specialized commodities, such as concrete products, exterior cladding, and paints, are primarily produced for domestic consumption, but are impacted more by the non-residential than the residential market.

Table 6: Building Materials Sub-industries: Distribution of Direct GDP Impact by Demand Source, 1995 (Percentages)

	Residential Construction			Non-residential Construct. & Repair	Exports	Total
	New Const.	Resident. Engineer.	Repair & Renovation			
Gypsum, Wallboard	21.7	*	25.2	28.7	24.3	100
Plumbing Fixtures	15.9	1.1	21.4	39.7	22	100
Windows & Doors	33.1	0.5	31.3	22.3	12.9	100
Roofing	19.8	0.2	18.1	14.2	47.6	100
Insulation	15.2	*	16.6	22.8	45.4	100
Heating & Air Conditioning	21.8	*	24.6	24.7	28.9	100
Exterior Cladding	15.7	3.1	14.4	52	14.9	100
Flooring	11.6	0.3	11.9	8.9	67.3	100
Concrete Products	9.3	4.5	16.6	59.1	10.5	100
Lumber	5.7	*	9.8	13.1	71.4	100
Paints	5	0.2	31.2	51.8	11.8	100
Textile Floor Coverings	16.4	*	37	22.1	24.5	100
Kitchen Cabinets	34.8	*	29.3	6.3	29.5	100
Floor & Wall Coverings	8.9	*	9.4	14.4	67.3	100
Total	12.4	1	17.1	27.6	41.8	100

* means percentage is less than 0.1

Note: Data along rows may not add to 100% due to rounding

Limitations of the Research

The results of this research program are subject to certain qualifications and limitations. In the simulations of new housing activity, the additional investment was treated as an autonomous stimulus that was unrelated to any change in government policy or in household behaviour. A more comprehensive and realistic analysis would look at accompanying changes in government, household, and business spending. Households, for example, might cut back on car purchases or travel to cover increased spending on housing. Governments may reduce spending in other areas to finance incentives aimed at encouraging increased housing activity. Such spending reductions would at least partly offset the impact of increased investment in housing.

As well, the research does not take account of the potential implications of a change in the housing stock. Investment that significantly changed the size and/or quality of the housing stock would affect rents (paid and imputed) and, thereby, exert an additional impact on spending flows in the economy. Moreover, a growth in the housing stock could reduce the future demand for new residential construction. The increase in current housing activity could thus give rise to a corresponding decline in future housing activity.⁷ This possibility is not examined in the simulations.

In addition, there is need to be mindful of the qualifications that apply to any research of this nature:

- results are highly sensitive to the economic and policy assumptions used in the simulations;
- the features of the economic model used to run the simulations will have an important influence on the findings; and
- the reasonableness of the estimated impacts will also depend on how well the available Input-Output database captures current inter-industry transactions in the Canadian economy.

Conclusions

Housing construction and renovation activity, ancillary land and infrastructure development, and related real estate, legal and financing services have a significant impact on output and employment in the Canadian economy. Although the specific results depend on the assumptions being made and the features of the model being employed, the research suggests that a temporary increase in expenditures on new residential construction or on renovations has significant direct, indirect and induced impacts on Gross Domestic Product and employment. Each additional dollar spent on new residential construction is estimated to increase Gross Domestic Product over five years by between 20 cents and \$2.30. When ancillary expenditures on activities such as land and infrastructure development and various related services (real estate, legal and financing) are added to the impacts of new construction, each newly constructed housing unit gives rise to approximately between three and six person-years of employment in total over a five year period.

Construction companies, finance and legal professionals, trucking firms, and manufacturers of building products are among the main beneficiaries of increased housing activity. Just over 30% of the output of the building materials sector is attributable to demand from residential construction, with this percentage rising to over 60% for manufacturers of windows and doors and kitchen cabinets.

The potential inflationary effects from the type of housing expenditures being examined appear to be modest. Federal and provincial budgetary balances, however, are likely to improve as a consequence of the positive impact of housing expenditures on economic activity and, thereby, on tax revenues.

A temporary housing stimulus takes time to gather momentum and the economic stimulus produced gives rise to some subsequent reduction in economic activity. Policy makers would face a formidable challenge in attempting to correctly time these positive and negative impacts and effectively use a temporary housing stimulus as an instrument

of countercyclical policy. In drawing policy conclusions, it is also important to take account of some considerations that were beyond the scope of the research. The studies do not examine the possibility, for example, that a stimulus will lead to an expansion of the housing stock, and give rise, in later years, to contrary pressures to reduce construction and restore balance in the housing market.

Notes:

- ¹ These percentages were calculated on the basis of 1999 data. New housing expenditures were \$23.9 billion in 1999, while spending on alterations was \$17.2 billion.
- ² The decline in output and employment in the FOCUS simulations is discussed on pages 20, 21, 38 and 39 of *The Macroeconomic Impacts of Housing Construction Activity*.
- ³ These results were derived using the FOCUS model. Simulations using TIM were not run for ancillary housing expenditures.
- ⁴ Constant dollar GDP measures the value of GDP after the effects of inflation have been removed.

- ⁵ GDP and spending are both adjusted to remove the impacts of price inflation.
- ⁶ To derive these numbers it was necessary to estimate the average price of a new housing unit. Dividing new housing expenditures in each of the last three years by new housing starts yielded an average price of \$155,500. The current dollar expenditures used in the simulations were divided by this number to obtain an estimate of the number of housing units likely to result from the proposed expenditure increases. From these calculations and the employment estimates in the model, it was then possible to estimate the number of jobs resulting from each new housing unit. This exercise only provides a very rough approximation of the jobs per new housing unit. The mix of housing changes from year to year and these changes affect the average price of new housing. Consequently, employment per housing unit may change significantly from one period to the next.
- ⁷ This is distinct from the “contractionary aftershock” that is examined in the simulations.

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Research Reports:

1. *Macroeconomic Impacts of the Housing Sector*
2. *Economic Impacts of Ancillary Housing Expenditures*
3. *The Macroeconomic Impacts of Housing Construction Activity: Simulations with the FOCUS Model*
4. *The Macroeconomic Impact of the Building Materials Industry in Canada*

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The Research Reports are available from the Canadian Housing Information Centre at the address below.

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